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IN THE UNITED STATES PATENT & TRADEMARK OFFICE

IN RE APPLICATION OF: :  
TATSUYA ANDOH ET AL : ATTN: APPLICATION DIVISION  
SERIAL NO: NEW APPLICATION :  
FILED: HEREWITH : EXAMINER:  
FOR: COOKING METHOD FOR PULP :

PRELIMINARY AMENDMENT

ASSISTANT COMMISSIONER FOR PATENTS  
WASHINGTON, D.C. 20231

SIR:

Prior to examination on the merits, please amend this application as follows.

IN THE CLAIMS

Please cancel Claims 1-8 without prejudice and insert therefor the following new claims:

9. (New) A method for cooking pulp, which comprises the step of:

a) pulping a lignocellulose material with an alkaline cooking liquor containing polysulfides in the presence of a quinone-hydroquinone compound, wherein the oxidation-reduction potential of the quinone-hydroquinone compound in the form present during the cooking is from about 0.12-0.25 V to the standard hydrogen electrode potential,

which potential is a value calculated as a standard oxidation-reduction potential (Ea) with a hydrogen ion activity of 1.

10. (New) The method of Claim 9, wherein the oxidation-reduction potential is from about 0.14-0.20 V to the standard hydrogen electrode potential.

11. (New) The method of Claim 9, wherein the concentration of polysulfide sulfur in the alkaline cooking liquor containing polysulfides is at least about 6 g/l.

12. (New) The method of Claim 9, wherein the concentration of polysulfide sulfur in the alkaline cooking liquor containing polysulfides is at least about 8 g/l.

13. (New) The method of Claim 9, wherein the alkaline cooking liquor containing polysulfides is produced by electrolysis of white liquor or green liquor.

14. (New) The method of Claim 9, wherein the concentration of  $\text{Na}_2\text{S}$ -state sulfur calculated as  $\text{Na}_2\text{O}$  in the alkaline cooking liquor containing polysulfides is at least about 10 g/l.

15. (New) The method of Claim 9, wherein the alkaline cooking liquor during the cooking contains from about 0.01-1.5 wt.% of the quinone-hydroquinone compound based on bone-dry chip.

16. (New) The method of Claim 9, wherein a liquid to wood ratio of the cooking liquor during the cooking is from about 1.5-5.0 l/kg based on bone-dry chip.

17. (New) The method of Claim 9, wherein the quinone-hydroquinone compound comprises an alkyl anthraquinone, a quinone or hydroquinone compound.

18. (New) The method of Claim 17, wherein the alkyl anthraquinone comprises 1-ethyl-9,10-anthraquinone or 2-methyl-9,10-anthraquinone.

19. (New) The method of Claim 17, wherein the quinone compound comprises 1-hydroxy-9,10-anthraquinone, 2-(9,10-anthraquinoyl)-1-ethanesulfonic acid, 9,10-anthraquinone-2-sulfuric acid, 9,10-anthraquinone-2-carboxylic acid, 9,10-anthraquinone-2,7-disulfonic acid, benz ( $\alpha$ ) anthracene-7,12-dione, 1,4, 4a, 9a-tetrahydro-9,10-anthraquinone or 1,4-dihydro-9,10-anthraquinone.

20. (New) The method of Claim 9, wherein the lignocellulose material comprises soft wood.

21. (New) The method of Claim 9, wherein the lignocellulose material comprises hard wood.

22. (New) The method of Claim 9, wherein the alkaline cooking liquor containing polysulfides is prepared by electrolytically oxidizing an alkaline solution comprising sulfide ions.

23. (New) An alkaline pulp cooking liquor composition, comprising:

a) polysulfides; and

b) one or more quinone-hydroquinone compounds having, in a form present during pulp cooking, an oxidation-reduction potential of about 0.12-0.25V to the standard hydrogen potential;

which potential is calculated as a standard oxidation-reduction potential ( $E_a$ ) with a hydrogen ion activity of 1.

24. (New) The composition of Claim 23, wherein the oxidation-reduction potential is from about 0.14-0.20 V to the standard hydrogen electrode potential.

25. (New) The composition of Claim 23, wherein the concentration of polysulfide sulfur in the alkaline cooking liquor containing polysulfides is at least about 6 g/l.

26. (New) The composition of Claim 23, wherein the concentration of polysulfide sulfur in the alkaline cooking liquor containing polysulfides is at least about 8 g/l.

27. (New) The composition of Claim 23, wherein the alkaline cooking liquor containing polysulfides is produced by electrolysis of white liquor or green liquor.

28. (New) The composition of Claim 23, wherein the concentration of Na<sub>2</sub>S-state sulfur calculated as Na<sub>2</sub>O in the alkaline cooking liquor containing polysulfides is at least about 10 g/l.

29. (New) The composition of Claim 23, wherein the alkaline cooking liquor during the cooking contains from about 0.01-1.5 wt.% of the quinone-hydroquinone compound based on bone-dry chip.

30. (New) The composition of Claim 23, wherein a liquid to wood ratio of the cooking liquor during the cooking is from about 1.5-5.0 l/kg based on bone-dry chip.

31. (New) The composition of Claim 23, wherein the quinone-hydroquinone compound comprises an alkyl anthraquinone, a quinone or hydroquinone compound.

32. (New) The composition of Claim 23, wherein the alkyl anthraquinone comprises 1-ethyl-9,10-anthraquinone or 2-methyl-9,10-anthraquinone.

33. (New) The composition of Claim 23, wherein the quinone compound comprises 1-hydroxy-9,10-anthraquinone, 2-(9,10-anthraquinoyl)-1-ethanesulfonic acid, 9,10-anthraquinone-2-sulfuric acid, 9,10-anthraquinone-2-carboxylic acid, 9,10-anthraquinone-2,7-disulfonic acid, benz (α) anthracene-7,12-dion, 1,4, 4a, 9a-tetrahydro-9,10-anthraquinone or 1,4-dihydro-9,10-anthraquinone.

34. (New) The composition of Claim 23, wherein the alkaline cooking liquor containing polysulfides is prepared by electrolytically oxidizing an alkaline solution comprising sulfide ions

#### REMARKS

Claims 1-8 have been cancelled. New Claims 9-34 have been added and are now active in this case.

Claims 1-8 have been cancelled and new Claims 9-34 have been added. All of the above amendments are fully supported by the claims and disclosure as originally filed. No new matter has been added.

Accordingly, it is believed that the present invention is in now in condition for examination on the merits. Favorable consideration is earnestly solicited.

Respectfully submitted,

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IN THE CLAIMS

Claims 1-8 (Canceled).

Claims 9-34 (New).

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